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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)
05-409

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Application Number
10/535,684

Filed
5-19-05

First Named Inventor
Jeffrey Powell

Art Unit
2831

Examiner
H.V. Ngo

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

/A. Blair Hughes/

Signature

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

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Registration number if acting under 37 CFR 1.34 _____

August 27, 2008

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 05-409)

In the Application of:)	
)	
Jeffrey Powell et al.)	Examiner: H.V. Ngo
)	
Serial No. 10/535,684)	
)	Group Art Unit: 2831
Filed: May 19, 2005)	
)	Conf. No. 7931
Title: Improvements Relating to Electronic Circuit Packages)	
)	
Commissioner for Patents		
P.O. Box 1450		
Alexandria, VA 22313-1450		

Sir:

PRE-APPEAL BRIEF REQUEST FOR REVIEW REMARKS

Pre-appeal brief review is requested for the above application. This paper sets forth Applicant's concise statement of clear errors in the Examiner's final rejection.

I. BACKGROUND

Claims 1-33 are pending in the application. Claims 1, 15, 18 and 28 are independent claims.

Claims 1, 5-6, 8-12, 15-20 and 22 stand rejected for anticipation over Choon et al. (5,608,188).

Claims 1-12, 15-20, 23-25 and 27 stand rejected for anticipation by Benzoni (5,416,668)

Claim 21 stands rejected for obviousness over Choon. Claims 13-14 stand rejected for obviousness over Choon in view of Miska (6,901,660). Claim 26 is rejected for obviousness over Benzoni, and claims 28-31 are rejected for obviousness over Benzoni in view of Henry (5,098,735).

II. THE INVENTION

The applicants wish to point out the general differences between the claimed invention and the prior art before responding to the examiner's prior art rejections. As an initial matter, the purpose of the prior art devices is quite different from the purpose of the claimed device. The

prior art devices are EM shielding devices while the presently claimed inventions are EM absorption devices and methods. An electrical shield will prevent an EM signal from passing through it. In the case of both Choon and Benzoni, the shield achieves this by providing a very low resistance wall (e.g. a copper or silver metal layer) usually with a conductive path to ground. At high EM frequencies, the very low resistance wall of the prior art devices will shield by reflecting most of the energy that impinges upon it. At lower EM frequencies, the prior art devices will short the current induced in the wall to ground. Reflection of the highest EM frequencies in the Choon and Benzoni devices can cause the EM radiation to couple back into the circuitry house within the package potentially leading to problems.

The claimed invention does not attempt to provide a very low EM resistance path or to reflect higher EM frequencies. Instead, it converts the currents induced in the conductor to heat in the same way a resistor does. Thus, the EM radiation does not reflect back to interfere with the circuitry in the package. The presently claimed devices and methods maximize EM absorption by using a structure having a surface impedance which is adapted to be substantially similar to that of a predicted EM field within the cavity enclosing the circuitry. The characteristic impedance of the space within the cavity at a resonant frequency is given by the ratio of the electrical field magnitude to the magnetic field magnitude of the resonant EM mode. For such resonance to occur within a cavity of finite dimensions, it is not possible for either the electric field magnitude to be zero or the magnetic field magnitude to be infinite. It is therefore not possible for the ratio of the first to second to be zero. Consequently, presenting a surface of very low impedance (as used in both Choon and Benzoni) into the cavity would not serve the purpose of absorbing EM radiation coupling into such a resonant mode of finite characteristic impedance – which is the purpose of the claimed invention.

III. THE CHOON ANTICIPATION REJECTION TRAVERSE

The examiner rejected claims 1, 5-6, 8-12, 15-20 and 22 for being anticipated by Choon et al. (USP 5,608,188). The rejected claims are not anticipated at least because Choon does not disclose a surface extending into the cavity that is at least a partially absorbent to EM radiation.

The examiner has not cited to any portion of Choon that discloses an EM absorbent surface. Instead, the examiner relies upon the EM shield of Choon for disclosing this feature. The EM shield used in Choon is “pre-tinned brass” which is an extremely conductive material

that will be reflective of high frequency EM radiation and not absorbed. (Choon col. 2, ln 45-55).

All of the rejected independent claims 1, 15 and 18-19 are directed to methods and apparatuses that include a layer of conductive material that is “at least partially absorbent to electromagnetic radiation”. It appears that the examiner’s rejection may lie in part to some confusion about the use of the term “conductive material” in the claims. It will be appreciated by a person of skill in the art that the term “conductive material” as the Applicant uses it does not necessarily mean that the material has to be highly conductive. Moreover, according to the claims, the conductive material must have the property of being “at least partially absorbent to electromagnetic radiation”. The combination of a conductive material that is at least partially absorbent to electromagnetic radiation acts as a resonate mode suppressor for a cavity in which it lies. This is evident from the specification where it can be seen that there is a gap between the lower edge of the surface and the base of the cavity. (*See e.g.*, Figure 4).

Choon does not disclose a conductive material that is at least partially absorbent to EM radiation. Moreover, Choon requires contact between its partition and the mounting surface. These features clearly indicate that the Choon material must be and acts as an EM shielding material and not an EM absorptive material. For at least this reason, claims 1, 5-6, 8-12, 15-20 and 22 are not anticipated by Choon.

Claim 5, which refers to a vane is independently patentable over Choon because Choon does not describe a structure including a vane. Instead, it describes a full partition separating a single cavity into two more cavities.

Claim 6 is independently novel because Choon does not describe or otherwise disclose a device wherein the conductivity of the surface is adapted to have a specific resistance substantially similar to that of a predicted electromagnetic field present in the cavity.

Claim 20 is also independently patentable over Choon. Claim 20 concerns methods for choosing the conductive region – either by simulation or by trial and error. The portion of Choon cited by the examiner for disclosing this feature merely discloses that the shield is made out of brass. Therefore, Choon does not disclose or suggest the feature of dependent claim 20.

VI. THE BENZONI ANTICIPATION REJECTION

The examiner rejected claims 1, 15-20, 23-25 and 27 for being anticipated by Benzoni (USP 5,416,688). All of the rejected claims are novel over Benzoni at least because Benzoni

does not disclose the use of a conductive surface that is at least partially absorbent to EM radiation as set forth in all of the independent application claims. What Benzoni discloses instead is the use of highly conductive plating, such a copper to provide a “low resistance electrically conductive coating that effectively blocks the shields” EM radiation. (*See* column 3, lines 30-31). The present invention works, as described in Section II above, to absorb EM radiation – something that does not take place significantly in a very low resistance environment. In this respect, the operation of the Benzoni device is very similar to that of Choon as both references use low resistance coating and operate to divide a single cavity effectively into two electrically independent cavities. In this respect, the Benzoni devices act as an EM shield and not an absorber. For at least this reason, claims 1, 15-20, 23-25 and 27 are novel over Benzoni.

V. THE OBVIOUSNESS REJECTION

The examiner rejected claims 14-15 as being unpatentable for obviousness over Choon in view of Miska (USP 6,901,660). Moreover, the examiner rejected claim 21 for being obvious over Choon alone and claim 26 for being obvious over Benzoni alone.

Claims 13-14 and claims 20 and 26 are nonobvious and patentable for the same reasons set forth in traversing the anticipation rejection of Choon and Benzoni above. Namely, neither reference discloses nor suggests a package having a conductive material surface that is adapted to and that is intended to operate to be at least partially absorbent to electromagnetic radiation.

Claims 13-14 are also non-obvious and patentable because the combination of Choon and Miska does not result in a package as claimed in claim 13 or 14. Miska, although using nichrome coatings uses it for an entirely different purpose than the coatings of the present invention are used. The Miska nichrome coatings are used to produce a hardwearing surface resistant to oxidation. Therefore, there is no suggestion in Miska of adapting the conductivity of the nichrome to match that of an EM field as claimed. Moreover, one of ordinary skill in the art would have no reason to desire to modify the structure of Choon with a hardwearing surface such as the nichrome of Miska as there is no reason why one would need a hardwearing surface in the devices claimed devices. Therefore, one skilled in the art at the time of the invention would not have combined the references as the examiner has. Finally, even if one were to combine the coat the partition of Choon with nichrome carbon, it would be done for the purposes of preventing oxidation. Therefore, one skilled in the art would not be concerned with adapting its

conductivity as per claims 13 and 14. The examiner's rejection of claims 13-14 over Benzoni in view of Miska is traversed for the same reasons.

Claim 21 is nonobvious over Choon et al. for the reasons recited in Section III above.

Claim 26 is nonobvious over Benzoni for the same reasons recited in Section IV above.

The examiner rejected claims 28-33 for being obvious over Benzoni in view of Henry. The examiner's obviousness rejection is traversed because the combination would not result in the claimed invention and because one skilled in the art would not combine the references as the examiner has.

Independent claim 28 includes all the limitations of independent claim 1 plus the limitation that the conductive region has a resistivity between $10\Omega/\text{square}$ and $1\text{ k}\Omega/\text{square}$. The combination of Benzoni and Henry does not disclose or suggest the invention of claim 28. In particular, Henry is directed to a paint that is designed to paint buildings. Buildings clearly have massive difference in scale as compared to the cavities that would be employed to house circuitry operating at millimetre wave frequencies. The teachings of Henry therefore are not analogous to the presently claimed invention. Henry does not relate to or solve the problems faced by the inventors. Henry, therefore, cannot be considered because it does not satisfy the non-analogous prior art test.

Henry also would not be considered because it is strictly limited to paints that are made from a nickel-resin mix. (See column 2, lines 9-12). Furthermore, Henry is also limited in its impedance to $377\Omega/\text{square}$ where as the present invention has much more flexibility to be adapted to use to reach resistivity chosen according to the actual impedances measured or predicted to be presented within the cavity. For each of these reasons, claims 29-33 are nonobvious and patentable over Benzoni in view of Henry.

Respectfully Submitted,

Date: August 27, 2008

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